OE6980: COMP. AID. SURFACE DEV. FOR MARINE VEHICLES

Course Content:

Module 1: Introduction and classification of geometric modeling forms for curves, surfaces and volumes; differential geometry of curves and surfaces; introduction to spline curves; Bezier splines; Uniform/non-uniform Rational B-splines; and fitting, fairing and generalized cylinders. Module 2: Introduction to blending surfaces; intersection problems in geometric design; offsets of parametric curves, surfaces and volumes; constructive solid geometry, boundary representation; decomposition models; and advanced topics in differential geometry. Module 3: Object matching; finite element and boundary element meshing algorithms; robustness of geometric computations; introduction to interval methods; scientific visualization; variational geometry; tolerances; inspection methods; feature representation and recognition; and shape interrogation for design, analysis, and manufacturing.

Text Books:

1. **G. Farin** (2001), Curves and Surfaces for CAGD: A Practical Guide, The Morgan Kaufmann Series in Computer Graphics, 5th edition, Morgan Kaufmann, USA.
2. **D. F. Rogers and J. A. Adams** (1989), Mathematical Elements for Computer Graphics, 2nd edition, Tata McGraw-Hill, India.

Reference Books:

1. **K. K. Dube** (2009), Differential Geometry and Tensors, I. K. International Publishing House PL, India.
2. **Q. Khan** (2012), Differential Geometry of Manifolds, Prentice Hall India Learning Private Limited, India.
3. **N. M. Patrikalakis and T. Maekawa** (2010), Shape Interrogation for Computer Aided Design and Manufacturing, Springer.
4. **D. Somasundaram** (2008), Differential Geometry: A First Course, Narosa Book Distributors, India.

Prerequisite:

Consent of teacher